

September 27, 1999

4WD-RPB

SUBJ: Evaluation of Universal City Property Management Company III's status under the RCRIS Corrective Action Environmental Indicator Event Codes (CA725 and CA750)
EPA I.D. Number: FLR 000 049 718

FROM: Jay V Bassett
South Programs Section

THRU: Wes Hardagree, Acting Chief
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TO: Narindar M. Kumar, Chief
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I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of Universal City Property Management Company III's (hereafter called "Universal") status in relation to the following corrective action event codes defined in the Resource Conservation and Recovery Information System (RCRIS):

- 1) Current Human Exposures Under Control (CA725),
- 2) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the RCRA Programs Branch Chief is required prior to entering these event codes into RCRIS. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate location within Attachments 1 and 2.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the first evaluation performed by EPA for Universal. However, the property owned by Universal was previously owned by Lockheed Martin Corporation. An EI Evaluation of the property under Lockheed Martin Corporation's ownership was made in August 1995 (see Attachment 3).

III. FACILITY SUMMARY

Universal's Sand Lake Road Complex is located on Sand Lake Road in Orlando, Florida. The complex covers approximately two thousand (2,000) acres. The acreage was purchased from Lockheed Martin Corporation in December 1998. Lockheed Martin Corporation operated a number of facilities on this property from approximately 1952 to 1996. Historically, the primary function of the Lockheed Martin Corporation facility was to develop, manufacture and test a variety of missiles, guided projectiles, weapons delivery systems and communication and electronics systems. With Lockheed Martin Corporation's sale to Universal in December 1998, a change in the property's use occurred. Universal's ultimate plan is to develop the property into a mixed commercial use project, including convention, resort, commercial and hotel enterprises. Currently the only activities ongoing at the facility are related to assessment and remediation of environmental contamination.

Universal's Sand Lake Road Complex includes a RCRA unit which is regulated under a Post-Closure Permit issued the Florida Department of Environmental Protection (FDEP). The Post-Closure unit previously contained hazardous waste sludge cells (F006 - wastewater treatment sludges from electroplating operations). Although the sludge cells have been removed, contaminated groundwater remains under corrective action. In purchasing the property, Universal also assumed the responsibility and liability which comes with the EPA administered permit issued pursuant to the Hazardous and Solid Waste Amendments (HSWA). The HSWA Permit address corrective actions necessary for releases from solid waste management units (SWMUs) and areas of concern (AOCs).

Although the number is always subject to change given new information, a total of thirty (30) SWMUs or AOCs require further assessment of the scope and extent of contamination. The most known significant contamination is associated with six (6) existing landfills. Interim Measures are ongoing under the HSWA Permit at three (3) landfills and Interim Measures for landfill 5 is deferred to the current remediation being conducted pursuant to the Post-Closure Permit. [Interim Measures are activities which prevent or lessen the continued migration of contamination. Interim Measures may be used to protect human health and the environment from current or potential threats.] All four (4) of the remedial actions were previously begun by Lockheed Martin Corporation (i.e., groundwater extraction at Landfills 3 and 4, RCRA Regulated Unit (including Landfill 5) and Landfill 6). This work is continuing under Universal's ownership. In addition to continuing Interim Measures already initiated, Universal is beginning to evaluate Interim Measures for another area of groundwater contamination, the Pershing/Waste Conservation Area.

It should also be noted that Universal plans to excavate the six (6) existing landfills on its property. This stabilization action is scheduled to begin at Landfills 3 and 4 and progress eastward across the site. The Interim Workplan for Landfill 3 has been submitted and approved by EPA. The Interim Measures Work Plans does provide provisions for public participation. EPA envisions that this public participation plan will be flexible enough to be utilized as a public participation template during subsequent Interim Measures and the Corrective Measures

Study(ies).

IV. CONCLUSION FOR CA725: Current Human Exposures under Control

Complete pathways to soil contamination were determined to exist at this site for workers, construction workers and trespassers. It should be noted that although groundwater contamination exists at the site, there are no drinking water wells present (i.e., no exposure points; hence, a complete exposure pathway is not possible). Despite the three (3) above noted complete pathways to soil contamination, unacceptable current human exposures are deemed to not be occurring. The actual or realistic exposure to soil contamination is expected to be much less than the corresponding assumptions found in the generic risk levels used to help establish potentially unacceptable levels of soil and sediment contamination. In other words, the exposure frequency and duration is expected to be much less than the estimates made in the default generic risk based levels which are 250 days/year and 25 years, respectively. For example, the soil contamination is located in remote areas of the facility, and EPA deems it to be unreasonable to assume that a trespasser or construction worker would be expected to visit the internal drainage ditch for 250 days out of the year. In addition, all of the landfills are covered and vegetated. More importantly, the Universal facility is not operating and only personnel who are associated with the assessment and cleanup of the contamination are expected to enter and work at the facility. These individuals are to be covered under an adequate Health and Safety Plan. Lastly, the facility is fenced and a security force monitors access. In other words, the contamination is not in areas where untrained workers would routinely visit. The recommendation is that CA725 YE be entered into RCRIS.

V. CONCLUSION FOR CA750: Migration of Groundwater Contamination not under Control

There are nine (9) identified areas of groundwater contamination at Universal. Four (4) of the nine (9) have active remediation systems operating. Of these four (4) systems, groundwater monitoring, capture zone analysis and potentiometric contours suggest that the migration of groundwater contamination is controlled. Because the remaining five (5) plumes do not have any remediation systems in place nor have been adequately delineated, all of the groundwater releases at Universal are not under control. The recommendation is that CA750 NO be entered into RCRIS.

VI. SUMMARY OF FOLLOW-UP ACTIONS

Since current human exposures are under control based on current land usage, follow-up actions are not needed for CA725. However, additional work is needed before the migration of groundwater contamination can be considered under control. It should be noted due to the number of contaminated areas at this facility, the general plan is to prioritize corrective actions over the coming years. Therefore, some areas will not adequately be addressed from a CA750 standpoint for several years to come. Despite the number of areas which must be addressed at Universal and the necessary prioritization, the ultimate goal is to take actions over the next six (6) years which will lead to the reaching CA750 YE by 2005. The following paragraph outlines the priority of actions by contaminated area and provides an estimated time-line of key decisions needed for controlling migration.

Two (2) of the five (5) areas of groundwater contamination which are currently uncontrolled are planned for source removal (i.e., Landfills 1 and 2 will be excavated). The current plan for Landfills 1 and 2 is for groundwater remediation to commence once the landfills have been removed. It is expected that removal of the waste materials and associated contaminated media source should improve groundwater quality in the short term. Excavation of Landfill 1 and 2 is planned for FY 02, after the excavation of Landfills 3 and 4 are completed. The excavation of Landfill 3 is to begin early in FY 00. The excavation and installation of a groundwater stabilization measure should take approximately six (6) months. Landfill 4 removal will likely take about another six (6) months. It is estimated that Landfills 3 and 4 stabilization measures will be completed and functional by the end of FY 00. It is expected that Landfills 1 and 2 stabilization measure should be completed by end of FY 01 or early FY 02.

One of the areas of uncontrolled groundwater contamination has had Interim Measures recently imposed (i.e., the Pershing/Waste Conservation Area). Further field work to complete the characterization of contamination at the Pershing/Waste Conservation Area and to support work plan development for Interim Measures is currently planned for mid FY 00. Work Plan development at the Pershing/Waste Conservation Area is currently underway and should be submitted this Fiscal Year. Approval of the groundwater remediation system is expected late FY 00 or early in FY 01.

The last two (2) areas of groundwater contamination, which are rather small in areal extent and contaminant concentration, fall into the second tier of environmental priority at Universal (i.e., the Launch Test Area and Ordnance 2 Area). Completion of the extent of contamination and long-term monitoring is planned for these two (2) areas while higher priority environmental issues are being addressed through Interim Measures. A plan for long-term groundwater monitoring at the Launch Test Area was called for by the Agency in May of 1999. Given the release and plume characteristics, EPA suspects that natural attenuation might be ultimately proposed for these two (2) areas. Therefore, EPA asked the facility to modify the pending Launch Test Area groundwater monitoring plan to include those parameters needed to substantiate and consider the applicability of natural attenuation as the final remedy or as part of the final remedy. Evaluation on the possible application of natural attenuation at Ordnance 2

Area will be made in early FY 00. A decision on the implementation of groundwater remediation at these small plumes are projected to be made by the end of FY 02 or early FY 03.

It is projected that CA750 will reach YE for Universal in Fiscal Year 2004

Attachments:	1. CA725:	Current Human Exposures Under Control
	2. CA750:	Migration of Contaminated Groundwater Under Control

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)**

**ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)**

Current Human Exposures Under Control

Facility Name: Universal City Property Management Company III
Facility Address: Sand Lake Road Complex, Orlando, Florida
Facility EPA ID #: FLR 000 049 718

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 X If yes - check here and continue with #2 below,
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			Rationale: Extensive sampling has occurred at this site since the mid-1980's. Key Contaminants: Volatile organic compounds (VOCs - e.g., Trichloroethylene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans 1,2-dichloroethene, vinyl chloride)
Air (indoors) ²		X		Rationale: There is no reason to believe that indoor air is contaminated.
Surface Soil (e.g., <2 ft)	X			Rationale: The six landfills likely have portions which contain soil contamination within the zone classified as surface soil. Key Contaminants: metals, some VOCs
Surface Water	X			Rationale: Sampling along the internal drainage ditch, adjacent to landfill 1 and 5 indicated contamination above drinking water standards. Key Contaminants: Trichloroethylene, cis-1,2-dichloroethane and vinyl chloride.

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Media	Yes	No	?	Rationale/Key Contaminants
Sediment	X			Rationale: Due Diligence sampling revealed PAH's marginally exceeded residential soil RBC's. Key Contaminants: PAH's
Subsurface Soil (e.g., >2 ft)	X			Rationale: Five of the six landfills likely have portions which contain soil contamination within the zone classified as subsurface soil. Key Contaminants: metals, some VOCs
Air (outdoors)		X		Rationale: There is no reason to believe that outdoor air is contaminated.

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

 X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale:

The risk based levels used to establish groundwater contamination are the lower of the federal or state maximum contaminant limits (MCLs), when available. If MCLs are not available, then the lower of the risk based level found in the Region 3 Risk Based Concentration Table or the Florida Brownfields Cleanup Criteria were used (<http://www.epa.gov/reg3hwmd/risk/riskmenu.htm>, <http://www2.dep.state.fl.us/waste/programs/brwnfld/index.htm>, respectively).

The risk based levels used to establish soil contamination are the lower of the risk based level found in the Region 3 Risk Based Concentration Table or the Florida Brownfields Cleanup Criteria were used (see above websites).

The risk based levels used to establish sediment contamination are the same as that used for soil contamination (see above websites).

The risk based levels used to establish surface water contamination are MCLs, when available, or when not available, the lower of the risk based level found in the Region 3 Risk Based Concentration Table or the Florida Brownfields Cleanup Criteria (see above websites).

Groundwater: There are nine (9) main locations at the facility which have volatile organic groundwater contamination (i.e., Landfills 1 through 6, Pershing/Waste Conservation Area, Ordnance 2 Area, Launch

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Test Area). All of these areas to one extent or the other have contamination which exceeds the drinking water standards (i.e., MCLs) or similar risk based level for tap water ingestion. The following is a brief summary of the groundwater contamination. Not all constituents detected have been presented, but hopefully enough information is provided so a general understanding of the plume can be reached.

Landfills 1 and 2: Landfills 1 and 2 are closed SWMUs. Contaminants at Landfill 1 is found in the Surficial Aquifer, Intermediate Aquifer and the Floridan Aquifer. The Surficial Aquifer, Intermediate Aquifer and Floridan Aquifer plumes exceeded the appropriate risk based level. Field screening via Geoprobe and a field photoionization detector gas chromatograph indicates that the main constituents are volatile organics (e.g., tetrachloroethylene (PCE), trichloroethylene (TCE), 1,1,1 trichloroethane (1,1,1 TCA), trans 1,2-dichloroethene (1,2 DCE), cis 1,2-dichloroethene (cis 1,2 DCE), vinyl chloride, 1,1-dichloroethene (1,1 DCE). Except for possible lab contaminants, results from the permanent wells, located at the **boundary** of the plume previously as identified by the Geoprobe survey, for the most part indicated no MCL exceedances in the three contaminated aquifers.

The plume at Landfill 2 was found in the Surficial Aquifer and the Intermediate Aquifer. Field screening via Geoprobe and a field photoionization detector gas chromatograph indicates that the main constituents are volatile organics (e.g., TCE and PCE). The highest concentration of total volatile organics in the Surficial Aquifer was 271 ppb. Historically, the Intermediate Aquifer samples had concentrations of TCE that exceeded the MCL for TCE, 3 ppb. However, the May 1999, sampling event, revealed that TCE was marginally above the MCL in three surficial wells with no VOC detections noted in the intermediate.

Landfills 3 and 4: Landfills #3 and #4 are closed SWMUs. The aquifers contaminated above relevant risk based levels by either Landfill 3 or Landfill 4 include the Upper Surficial, Lower Surficial and Intermediate and the Floridan Aquifers. Groundwater remediation of the Surficial Aquifer at Landfill 3 began in 1988. The systems consists of a series of wellpoints and a 600 foot long horizontal recovery well in the Surficial Aquifer. Groundwater remediation at Landfill 4 began in 1989. The current system consists of three wellpoint systems, individual Surficial Aquifer recovery wells, and Intermediate Aquifer recovery wells.

The groundwater contaminants at Landfill 3 and Landfill 4 are volatile organics. The main constituents and highest concentration for Landfill 3 as of May 1999 were 1,2 DCE, TCE, and PCE at 27,000 ppb, 17,000 ppb, and 16,000 ppb, respectively. The main constituents and highest concentrations for Landfill 4 as May 1999 were 1,2 DCE, and 1,1 DCE at 2,800 ppb and 1,500 ppb, respectively. For comparison, the primary drinking water standards (i.e., MCLs) for 1,2 DCE, TCE, and 1,1 DCE are 70 ppb, 3 ppb and 7 ppb, respectively.

Landfill 5 and the RCRA Regulated Unit: Landfill 5 and the RCRA Regulated Unit (i.e., removed hazardous waste sludge cells) are closed SWMUs and geographically co-located. A Closure/Post-Closure Permit transfer was issued by FDEP in June 1999 for the RCRA Regulated Unit. Monitoring and remediation of the RCRA Regulated Unit under the Post-Closure Permit also covers the groundwater contamination associated with Landfill 5. The Surficial, Intermediate and Floridan Aquifers all have some areas of contamination above MCLs and relevant risk based levels.

The groundwater contaminants at Landfill 5 and the RCRA Regulated Unit are volatile organics. The main constituents and highest concentrations as of May 1999 were 1,1 DCE, cis 1,2 DCE, and TCE, at 210 ppb, 1,100 ppb, 370 ppb, respectively. The MCLs for 1,1 DCE, cis 1,2 DCE, TCE, vinyl chloride and PCE are 7ppb, 70 ppb, and 3 ppb, respectively.

Landfill 6: Landfill 6 is a closed SWMU. Groundwater remediation at Landfill 6 began in February 1994.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

The groundwater contaminants at Landfill 6 are volatile organics. As of May 1999, the only VOC contaminants that exceeded a GCTL were Naphthalene and Xylene at 25 ppb and 20 ppb, respectively. The upper and lower Surficial Aquifer both contain low concentrations of volatiles. Historically, only three wells in the upper Surficial Aquifer are contaminated above MCLs, and only one sample in the lower Surficial Aquifer has indicated a contaminant concentration above the MCL.

Ordinance 2 Area: This area contains a number of SWMUs and AOCs. However, only two (2) locations have been identified as containing groundwater contamination. The plume located near the outdoor sump and drainage channels is limited to the Surficial Aquifer, and it has been sampled twice. The first round of sampling and analysis detected 1,1 DCE at 31 ppb and cis 1,2 DCE at 84.3 ppb. Benzene was also reported at 1.3 ppb. These concentrations exceed their respective MCLs. The plume appears to be of limited areal extent. The second round of sampling did not detect these constituents. Further monitoring is planned.

A similar story exists for the second plume which is near the Open Area A and Building X-7 (i.e., small plume in the Surficial Aquifer, low detections). In this plume, PCE was detected at 12 ppb. 1,2,4 Trimethylbenzene (TMB) and 1,3,5 trimethylbenzene were also detected. The MCL for PCE is 3 ppb. There is no MCL or generic risk level for the TMBs. The plume appears to be currently restricted to a single well point. Further characterization is planned.

Launch Test Area: There is one identified groundwater plume at the Launch Test Area. It is split between two (2) zones, the Surficial Aquifer and the Intermediate Aquifer. The Surficial Aquifer plume consists of PCE, TCE and cis 1,2 DCE whose maximum concentrations are as follows: 46 ppb, 52 ppb and 33 ppb. Concentrations for PCE and TCE exceed their respective MCLs of 3 ppb and 3 ppb. cis 1,2-DCE's MCL is 70 ppb. The Intermediate aquifer plume consists of PCE (at 120 ppb) and cis 1,2-DCE (at 77 ppb) exceed their respective MCLs.

Pershing/Waste Conservation Area: The groundwater plume at Pershing/Waste Conservation Area is found in the Surficial Aquifer, Shallow Intermediate Aquifer and Deep Intermediate Aquifer. Field screening via Geoprobe and a field photoionization detector gas chromatograph indicates that the main constituents are volatile organics (e.g., PCE, TCE, cis 1,2 DCE and BTEX).

With regard to the Surficial Aquifer, the maximum PCE concentration via Geoprobe sampling is 3,300 ppb. The maximum TCE concentration is 1,600 ppb. The maximum cis 1,2-DCE concentration is 3,200 ppb. The maximum BTEX concentration is 661 ppm. Although the specific concentrations are slightly different, permanent monitoring well sampling and analysis confirmed the elevated volatile organic concentrations in the Surficial Aquifer.

The concentrations in the Shallow Intermediate Aquifer are significantly lower than in the Surficial Aquifer. The highest total VOC concentration is 83 ppb and the second highest is 38 ppb. The highest total VOC concentration in the Deep Intermediate Aquifer is 82 ppb. The second highest concentration is 10 ppb. Permanent monitoring well sampling and analysis confirmed for the most part the elevated volatile organic concentrations in the Shallow and Deep Intermediate Aquifers. Additional Characterization and Interim Measures is planned to address groundwater contamination.

GROUNDWATER SUMMARY: The groundwater at this facility is contaminated above levels which would cause a concern for human exposures via ingestion. For example, given the groundwater contamination present at this facility, if ingestion of contaminated groundwater at this facility were to occur by a hypothetical resident or worker, an unacceptable risk to humans may exist.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Air (both indoors and outdoors): The soil concentrations do not support a conclusion that widespread releases to air are occurring. Soil risk based levels protective of inhalation for PCE, TCE, 1,1-DCA, 1,1-DCE, cis 1,2-DCE and trans 1,2-DCE, the main volatiles at the facility, are 11 ppm, 5 ppm, 1,300 ppm and 0.07 ppm, 1,200 ppm and 3,100 ppm, respectively. Although some limited soil samples exceed their respective soil risk based levels for inhalation (e.g., PCE at 129 ppm, TCE at 23 ppm in Landfill 3), these detections were measured within the landfill and not in surface soil and other samples did not exceed the soil risk based levels for inhalation.

AIR SUMMARY: The conclusion is that significant or widespread air contamination does not exist.

Soil (both surface and subsurface): There are several locations at the facility which have metal concentrations above the respective soil screening level for ingestion (i.e., Landfills 1 through 6). For example, chromium, cadmium have been reported in Landfill 3 at 23,000 ppm and 280 ppm, respectively. The residential risk-based level for these metals are 390 ppm and 78 ppm. Elevated metals are also expected in other landfills, especially Landfills 1 and 2. Based on the fact that groundwater is contaminated with volatile organics, specific locations may also exist within Landfills 1 through 6 which contain elevated volatile organic soil concentrations. In fact, some soil sampling within the landfill supports this supposition. For example, PCE has been detected in one sample at 129 ppm. The risk based level for ingestion of this constituent is 12 ppm.

Soil sampling at Pershing/Waste Conservation Area has not been completed. Based on the groundwater contamination, soil contamination above applicable risk based levels could exist. Soil sampling results at Ordnance 2 Area and Launch Test area do not support the conclusion that wide-spread soil contamination is a problem at these areas.

SOIL SUMMARY: In conclusion, there are locations at Universal SLRC where soil contamination exists at levels that may pose an unacceptable a risk to human health (above Region III Residential RBCs).

Surface Water: Sampling and analysis of five (5) locations where contaminated groundwater intersects surface water has occurred. The five (5) location are linked with Landfill 1, 4, 5, 6 and the Pershing/Waste Conservation Area. Sampling at Landfills 1, 4, 5 and 6 in 1998 also failed to find any surface water concentrations for groundwater constituents of concern above its respective groundwater MCL or RBC, as applicable. Additionally, samples collected at the Pershing/Waste Conservation Area in 1998 does not indicate any surface water releases. However, as reported in the RUST Due Diligence report, two samples collected near Landfill 1 and 5 within the Internal Drainage Canal indicated levels of cis-1,2-dichloroethane, TCE and vinyl chloride above its respective MCL and RBC.

SURFACE WATER SUMMARY: Surface waters located near Landfills 1 and 5 are contaminated above levels which would cause a concern for human exposures via ingestion and dermal contact. The extent of contamination is limited and based upon one sampling event. There appears to be no offsite surface water contamination, and hence no offsite exposure concern. Further long-term monitoring will occur.

Sediment: Sampling and analysis occurred at three (3) of the four (4) locations where contaminated groundwater intersects surface water. The three locations are linked with Landfill 1, 4 and the Pershing/Waste Conservation Area and of limited areal extent. Sampling and analysis of sediment at Landfills 1, 4 and the Pershing/Waste Conservation Area has not indicated any contamination of sediment above soil screening levels for ingestion. The RUST Due Diligence effort indicates one sample location

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)**

exceeding the Residential Soil RBC for PAH's. Benzo(a)pyrene at 230 ppb is of greatest concern. The sample appears to be isolated and is likely attributable from runoff from the adjacent to the Lockheed Martin Corporation paved parking area.

SEDIMENT SUMMARY: While sediments near northwest corner is contaminated above levels which may cause a concern for human exposures, it is unlikely that exposure will occur given that these are perennial waters and the PAH's were only detected in one sample adjacent to a parking structure. Therefore, while the ingestion of contaminated sediment could conceivably pose a risk to humans, and the assumption is made that sediment contamination exists, an unacceptable current exposure is unlikely .

References:

August 1999 Semiannual Effectiveness Report on Corrective Measures Implementation at Remedial Action Sites (Landfills 1 through 6);
December 1998 RFI Report for Pershing/Waste Conservation Area;
December 1998 RFI Report for Ordnance 2 Area;
October 1998 RFI Report for Landfill 1;
November 1998 RFI Report for Landfill 2;
December 1998 RFI Report for Launch Test Area.
RUST Due Diligence Report

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

<u>Summary Exposure Pathway Evaluation Table</u> Potential Human Receptors (Under Current Conditions)							
“Contami- nated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	No	No	No	No	No	No	No
Air (indoors)	Not Contam- inated (N/C)	N/C	N/C	N/C	N/C	N/C	N/C
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	Yes	No	No
Surface Water	No	Yes	No	Yes	Yes	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface, e.g., >2 ft)	No	No	No	Yes	No	No	No
Air (outdoors)	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not “contaminated” as identified in #2, please strike-out specific Media, including Human Receptors’ spaces, or enter “N/C” for “not contaminated.”
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have assigned spaces in the above table. While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- _____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).
- X If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.
- _____ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

Rationale:

Media by Media Exposure Point Summary:

Groundwater: There are no drinking water wells onsite; hence, there are no exposure points from which people could be exposed to the contamination. Although there is no offsite groundwater contamination, and hence no offsite exposure concern, it should be noted that the Orangewood Water Treatment Facility was located approximately 0.5 miles south of the facility. This wellfield was used to supply potable water to the Orange County franchise area. This wellfield ceased operation in 1998. Production wells associated with Sea World are also located about a mile south of the facility; production is from depths of 166 feet to 428 feet bls. This water is used for irrigation and industrial purposes (e.g., maintenance of aquatic life habitats). An exposure point for contaminated groundwater does not exist

Air (indoor and outdoor): Air contamination is not expected; therefore, an exposure point to air contamination does not exist.

Surface Water: Surface waters located near Landfills 1 and 5 is contaminated above levels which would cause a concern for human exposures via ingestion and dermal contact. Therefore, an exposure point for contaminated surface water does exist,

Soil (surface and subsurface): Soil is contaminated at all six (6) landfills and several other SWMUs. Soil contamination may also exist at the Pershing/Waste Conservation Area. Therefore, an exposure point to soil contamination exists.

Sediment: While sediments near northwest corner is contaminated above levels which may cause a concern for human exposures, it is unlikely that exposure will occur given that these are perennial waters and was only detected in one sample adjacent to a parking structure. Therefore, while the ingestion of contaminated sediment could conceivably pose a risk to humans, and the assumption is made that sediment contamination exists, an unacceptable current exposure is unlikely.

Complete Pathway Summary:

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)**

Operations at the facility are consistent with a commercial/industrial use. Residential, daycare, recreation land use under the current land use is not reasonable. In addition, there is no manner for food to become contaminated and ingested. However, given the current use of the property, complete pathways for workers, construction workers and trespassers to soil and surface water contamination are reasonable. Therefore, these three (3) receptors and two (2) contaminated media should be carried on to Question 4.

References:

August 1999 Semiannual Effectiveness Report on Corrective Measures Implementation at Remedial Action Sites (Landfills 1 through 6);
December 1998 RFI Report for Pershing/Waste Conservation Area;
December 1998 RFI Report for Ordnance 2 Area;
October 1998 RFI Report for Landfill 1;
November 1998 RFI Report for Landfill 2;
December 1998 RFI Report for Launch Test Area.
RUST Due Diligence Report

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

- 4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**⁴ (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

- X If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”
- If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”
- If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

Complete Pathway 1: Surface Soil -Worker/Construction Worker /Trespasser: Exposures under this complete pathway are considered insignificant for the following reasons. If workers were to contact the contaminated soil, ingestion would be incidental. In other words, the frequency of exposure (i.e., number of days exposed per year) and duration of exposure (number of years exposed) to contaminated soil when exposures occur would be much less than that used to establish the levels which mark a soil as contaminated in Question 2 (e.g., exposure frequency - 250 days/year; exposure duration - 25 years). This low frequency/low duration logic would also apply to any trespassers who could potentially breach the facility’s security (i.e., guards and a facility wide fence). In addition, all of the landfills are covered and vegetated. More importantly, since industrial operations have shut down, the workers who would be at the soil contaminated sites would be environmental field sampling or remediation personnel who know of the contamination and operate under a health and safety plan.

Complete Pathway 2: Subsurface Soil - Worker/Construction Worker /Trespasser: Exposures under this complete pathway are considered insignificant for the following reasons. Much of the soil contamination is found in established and well defined solid waste landfills. Therefore, exposure to subsurface soil contamination is not expected to occur without considerable effort to reach the vegetated landfills and breach the landfill’s limited soil cover. If workers were to contact the contaminated soil, ingestion would be incidental. In other words, the frequency of exposure and duration of exposure to contaminated soil when exposures do occur will be much less than that used to establish the levels which mark a soil as contaminated in Question 2. This low frequency/low duration logic would also apply to any trespassers who might potentially breach the facility’s security (i.e., guards and a facility wide fence). More importantly, since the industrial operations have shut down, the workers who would be at the soil

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

contaminated sites would be environmental field sampling or remediation personnel who know of the contamination and operate under a health and safety plan.

Complete Pathway 2: Surface Waters - Worker/Construction Worker /Trespasser: Exposures under this complete pathway are considered insignificant for the following reasons. Surface water contamination is limited to small area near Landfills 1 and 5, and is based upon one sampling event. There appears to be no offsite surface water contamination, and hence no offsite exposure concern. Therefore, exposure to surface water contamination is not expected to occur without considerable effort to breach security and fencing. If workers were to contact the contaminated surface water, ingestion would be incidental. In other words, the frequency of exposure and duration of exposure to contaminated surface water when exposures do occur will be much less than that used to establish the levels (residential RBC or MCL) which were used to determine surface water as contaminated. This low frequency/low duration logic would also apply to any trespassers who might potentially breach the facility's security (i.e., guards and a facility wide fence). More importantly, since the industrial operations have shut down, the workers who would be at the contaminated sites would be environmental field sampling or remediation personnel who know of the contamination and operate under a health and safety plan.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS Event Code (CA725)

5 Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

- _____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
- _____ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.
- _____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_____ IN - More information is needed to make a determination.

Supervisor _____ Date _____
Narindar Kumar
Chief, RCRA Programs Branch
(EPA Region) Region 4

US Environmental Protection Agency (EPA) - Region 4
61 Forsyth Street
Atlanta, GA 30303
Attention: RCRA Program Branch

Jay V. Bassett
404 562-8542
Bassett.jay@epa.gov

Page 15 (CA725 - Question 6)

ATTACHMENT 2
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: Universal City Property Management Company III
Facility Address: Sand Lake Road Complex, Orlando, Florida
Facility EPA ID #: FLR 000 049 718

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?
- X If yes - check here and continue with #2 below,
- If no - re-evaluate existing data, or
- If data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRAs). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”⁶ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

- X If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.
- If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”
- If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

See the discussion on groundwater found in the Rationale and Reference Section of Question 2 from CA725.

⁶ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”⁷ as defined by the monitoring locations designated at the time of this determination?

_____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”⁷).

 X If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”⁷) - skip to #8 and enter “NO” status code, after providing an explanation.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Landfills 1 and 2: Although groundwater contamination exists at Landfills 1 and 2, no groundwater controls are yet in place. Over the next three or so years, the contents of Landfills 1 and 2 will be removed (i.e., source removal). After completion of source removal, groundwater remediation will occur as needed to restore the groundwater to its beneficial use. Currently, a groundwater monitoring program is in place to monitor the water quality at the boundary of the landfills. This occurs on a semi-annual basis.

Landfills 3 and 4: Groundwater recovery systems have been installed at both Landfill 3 and 4 in all severely contaminated aquifers. The system for Landfill 3 began in 1988 while the system for Landfill 4 began operation in 1987. Based on an analysis of historical groundwater contamination and its location within the respective monitoring well networks, the groundwater plumes in all of the aquifers at Landfills 3 and 4 do not appear to be expanding. EPA does have a question on the contamination at Landfill 4 in the 50 foot Surficial Zone and the Intermediate Aquifer. However, for all other contaminated aquifers at Landfills 3 and 4, EPA concludes that the plumes are stabilized and not migrating. These landfills are covered under a semi-annual groundwater monitoring program.

Landfill 5 and the RCRA Regulated Unit: A modified groundwater recovery system for Landfill 5 started operations in May 1992 and full operation began in July 1992. Based on potentiometric maps, the plume appears to be contained (i.e., no longer expanding) for the Intermediate and Floridan Aquifers. The six (6) additional lower Surficial Aquifer recovery wells installed in 1995 appear to have also controlled the Surficial Aquifer Plume. Hence, EPA concludes that the plumes are stabilized and not migrating. This landfill is covered under a semi-annual groundwater monitoring program.

Landfill 6: A pump and treat system at Landfill 6 consists of two (2) recovery wells in the upper Surficial

⁷ “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

Aquifer. Based on groundwater flow maps, this system appears to have controlled the further migration of groundwater contamination above the MCLs. The system was shut down for a short period of time to look for a “rebound” affect. Samples collected in late 1998, indicated that the groundwater plume was migrating southward. The system was restarted in January 1999. Based on May 1999 semi-annual monitoring results, the plume migration has been stabilized. This landfill is covered under a semi-annual monitoring program.

Ordinance 2 Area: No controls are in place for the groundwater plumes at the Ordinance 2 Area. Further assessment and monitoring are planned.

Launch Test Area: No controls are in place for the groundwater plumes at the Launch Test Area. Further monitoring are planned.

Pershing/Waste Conservation Area: There are no controls in place for the groundwater contamination at Pershing/Waste Conservation Area. Interim Measures has been imposed under the draft HSWA Permit for the groundwater contamination and additional groundwater assessment and characterization is planned.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

4. Does “contaminated” groundwater **discharge** into **surface water** bodies?
- _____ If yes - continue after identifying potentially affected surface water bodies.
- _____ If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.
- _____ If unknown - skip to #8 and enter “IN” status code.

Rationale:

Reference:

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration⁸ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?
- _____ If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration⁷ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.
- _____ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration⁸ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations⁸ greater than 100 times their appropriate groundwater “levels,” providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.
- _____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

⁸ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁹)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,¹⁰ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment “levels,” as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of “contaminated” groundwater can not be shown to be “**currently acceptable**”) - skip to #8 and enter “NO” status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter “IN” status code.

Rationale and Reference(s):

⁹ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

¹⁰ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the “existing area of contaminated groundwater?”

_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the “existing area of groundwater contamination.”

_____ If no - enter “NO” status code in #8.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS Event Code (CA750)**

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_____ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the _____ facility, EPA ID # _____, located at _____. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

 X NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by _____ Date May 1999
 Jay V. Bassett
 Environmental Engineer

Supervisor _____ Date _____
 Wes Hardegree
 Acting Chief, South Programs Section
 (EPA Region or State) Region 4

Supervisor _____ Date _____
 Narindar Kumar
 Chief, RCRA Programs Branch
 (EPA Region or State) Region 4

Locations where References may be found:

US Environmental Protection Agency (EPA) - Region 4
61 Forsyth Street
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Attention: RCRA Programs Branch

Contact telephone and e-mail numbers

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